

MAIN REQUEST

Claims

1. A refrigerant composition which comprises:

- (i) pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane; trifluoromethoxypentafluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane, or a mixture of two or more thereof, in an amount from 30 to 50% by weight based on the weight of the composition
- (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least $2n-2$, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition.

with the remainder, not exceeding 60% by weight based on the weight of the composition, being:

- (iii) pentafluoroethane, trifluoromethoxydifluoromethane or hexafluorocyclopropane, or a mixture of two or more thereof.

2. A composition according to claim 1 wherein component (i) is present in an amount of 50% by weight based on the weight of the composition.

3. A composition according to claim 1 or 2 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.

4. A refrigerant composition which comprises:

- (i) pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, trifluoromethoxypentafluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane, or a mixture of two or more thereof, in an amount from 50 to 75% by weight based on the weight of the composition
- (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least $2n-2$, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition; with the remainder being
- (iii) pentafluoroethane, trifluoromethoxydifluoromethane or hexafluorocyclopropane, or a mixture of two or more thereof.

5. A composition according to claim 4 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.

6. A composition according to claim 4 or 5 wherein component (iii) is pentafluoroethane.

~~7. A refrigerant composition which comprises:~~

- ~~(i) 1,1,1,2- or 1,1,2,2-tetrafluoroethane, or a mixture of pentafluoroethane and 1,1,1,2- or 1,1,2,2-tetrafluoroethane, in an amount from 30 to 94% by weight based on the weight of the composition,~~
- ~~(ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least $2n-2$, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition,~~
- ~~(iii) pentafluoroethane in an amount from 5 to 60% by weight based on the weight of the composition with the proviso that the concentration of pentafluoroethane in the composition is not 5 to 20% by weight based on~~

- ~~the weight of the composition.~~
7. A composition according to any one of the preceding claims wherein component (ii) is present in an amount from 2 to 4% by weight based on the weight of the composition.
8. A composition according to claim 7 wherein component (ii) is present in an amount from 3 to 4% by weight based on the weight of the composition.
9. A composition according to any one of the preceding claims wherein component (ii) is a mixture of said hydrocarbons.
10. A composition according to any one of the preceding claims wherein component (ii) comprises a hydrocarbon which possesses 4 or 5 carbon atoms.
11. A composition according to claim 10 wherein component (ii) comprises a hydrocarbon which is n-butane.
12. A composition according to claim 11 which comprises:
- (a) 46 to 46.5% by weight of pentafluoroethane
- (b) 50 % by weight of 1,1,1,2-tetrafluoroethane and
- (c) 4 to 3.5% by weight, respectively, of n-butane.
13. Use as a refrigerant of a composition as claimed in any one of claims 1 to 12.
14. Use according to claim 13 in a refrigeration or airconditioning system designed to use chlorodifluoromethane as refrigerant.
- ~~15. Use of a refrigeration composition which comprises:~~
- (i) ~~pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3,3-heptafluoropropane, or a mixture of two or more thereof, in an amount from 30 to 94% by weight based on the weight of the composition and~~
- (ii) ~~an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least 2n-2, other than methyl propane, in an amount from 1 to 10% by weight based on the weight of the composition, as a replacement for chlorodifluoromethane.~~
- (iii) ~~pentafluoroethane in an amount from 5 to 60% by weight based on the weight of the composition, as a replacement for chlorodifluoromethane.~~
17. Use according to claim 15 wherein the composition is as defined in claim 13.
18. The process for producing refrigeration which comprises evaporating a composition as claimed in any one of claims 1 to 15 in the vicinity of a body to be cooled.
19. A refrigeration apparatus containing, as refrigerant, a composition as claimed in any one of claims 1 to 12.
20. A refrigeration apparatus according to claim 19 which is designed to use chlorodifluoromethane as refrigerant.

MAIN REQUEST

Claims

- 5 1. A refrigerant composition which comprises:
- (i) pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, trifluoromethoxypentafluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane, or a mixture of two or more thereof, in an amount from 30 to 50% by weight based on the weight of the composition,
- 10 (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least $2n-2$, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition,
- with the remainder, not exceeding 60% by weight based on the weight of the composition, being:
- 15 (iii) pentafluoroethane, trifluoromethoxydifluoromethane or hexafluorocyclopropane, or a mixture of two or more thereof.
2. A composition according to claim 1 wherein component (i) is present in an amount of 50% by weight based on the weight of the composition.
- 20 3. A composition according to claim 1 or 2 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.
4. A refrigerant composition which comprises:
- 25 (i) pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, trifluoromethoxypentafluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane, or a mixture of two or more thereof, in an amount from 50 to 75% by weight based on the weight of the composition,
- (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and
- 30 m is at least $2n-2$, other than methyl propane, in an amount from 1 to 4% by weight based

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on the weight of the composition,

with the remainder being:

(iii) pentafluoroethane, trifluoromethoxydifluoromethane or hexafluorocyclopropane, or a mixture of two or more thereof.

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5. A composition according to claim 4 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.

6. A composition according to claim 4 or 5 wherein component (iii) is pentafluoroethane.

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7. A composition according to any one of the preceding claims wherein component (ii) is present in an amount from 2 to 4% by weight based on the weight of the composition.

8. A composition according to claim 7 wherein component (ii) is present in an amount from 3 to 4% by weight based on the weight of the composition.

9. A composition according to any one of the preceding claims wherein component (ii) is a mixture of said hydrocarbons.

10. A composition according to any one of the preceding claims wherein component (ii) comprises a hydrocarbon which possesses 4 or 5 carbon atoms.

11. A composition according to claim 10 wherein component (ii) comprises a hydrocarbon which is n-butane.

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12. A composition according to claim 11 which comprises:

(a) 46 to 46.5% by weight of pentafluoroethane,

(b) 50% by weight of 1,1,1,2-tetrafluoroethane and

(c) 4 to 3.5% by weight, respectively, of n-butane.

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13. Use as a refrigerant of a composition as claimed in any one of claims 1 to 12.

14. Use according to claim 13 in a refrigeration or airconditioning system designed to use chlorodifluoromethane as refrigerant.

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15. The process for producing refrigeration which comprises evaporating a composition as claimed in any one of claims 1 to 12 in the vicinity of a body to be cooled.

16. A refrigeration apparatus containing, as refrigerant, a composition as claimed in any one
10 of claims 1 to 12.

17. A refrigeration apparatus according to claim 16 which is designed to use chlorodifluoromethane as refrigerant.